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MMS7000 Profiler

&

EVOsoft Analysis Software

Instrument and Software

User Guide

Document Version:	17.10.05
Applies To:	
EVOsoft Version:	v17.10.5.1
Profiler7000 Version:	v17.9.18.1

Contents

MMS7000 Profiler

1. Warnings & Precautions

Please read and understand this section fully before operating your MMS7000 Instrument. Failure to do so may result in damage to the instrument or personal injury.

- To avoid electrical shock, never mount the sensor in a live motor
- Ensure the sensor cable cannot be entangled with any moving or rotating equipment
- Do not operate the instrument in an explosive environment
- Use only the approved power adapter
- Do not use alcohol or any organic solvent to clean the instrument
- Only use the supplied stylus to avoid damaging the screen
- The Sensor is a precise measuring device and should be treated with care at all times

For information regarding the MMS7000 operating system, please refer to the MEZ1500 User Guide.

2. Powering Up

Ensure your MMS7000 is fully charged before use. To charge the device, connect the supplied USB communication cable to the bottom connector on the device, then insert the AC power adaptor plug into charging socket in the bottom left. The unit will **not** charge from a USB connection alone.

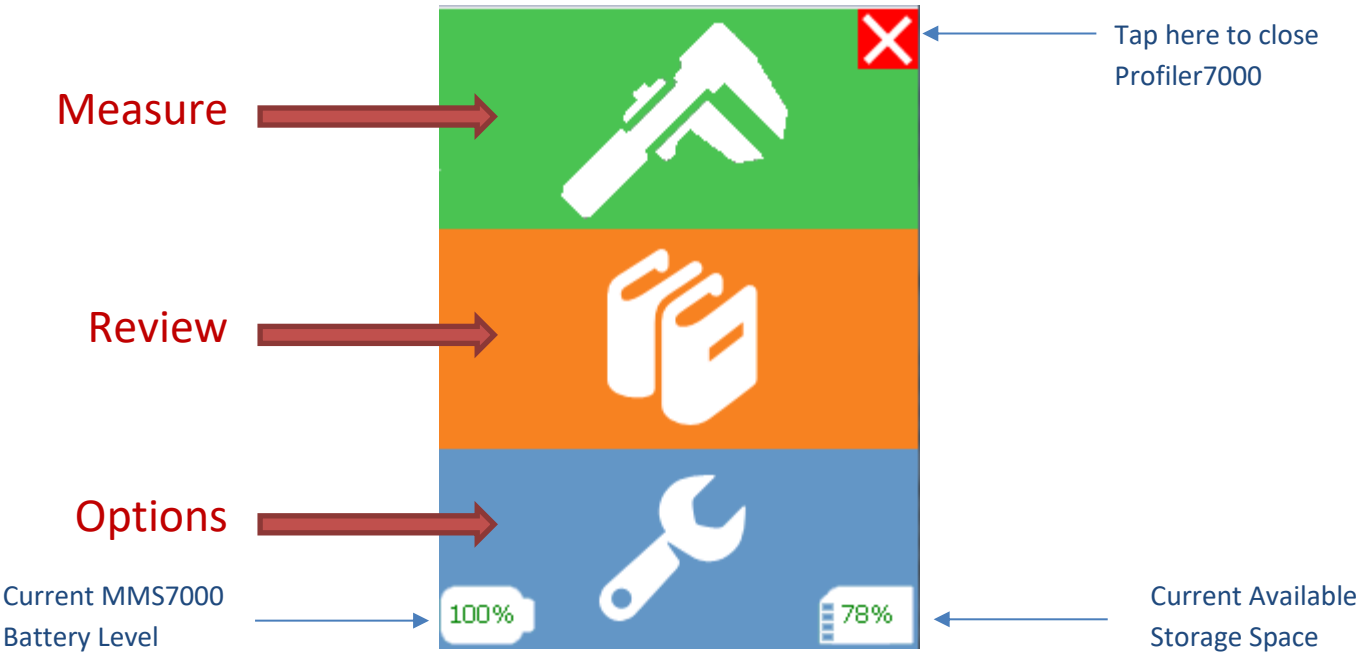
3. Basic Operation

The MMS7000 app is operated using the touchscreen. To select an option, you can tap firmly on the screen either with your finger or the included stylus. The stylus is made from black plastic and is stored in a slot in the top of the instrument on the right hand side.

NOTE: *If using something other than the included stylus, do not use anything with a sharp tip such as a pen or a metal tool! This will damage the screen and is not covered under your warranty.*

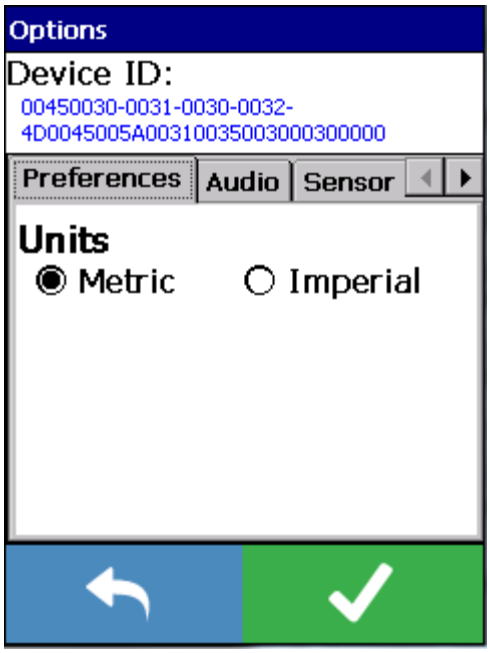
Power on your MMS7000 device  and wait for the Profiler7000 app to start. If the Profiler7000 app does not start automatically, you can start it yourself by double-tapping on the icon that appears on the Windows Desktop.

The Home Screen of the Profiler7000 app will now display, and offers 3 main options: Measure, Review & Options:



4. Setup Options

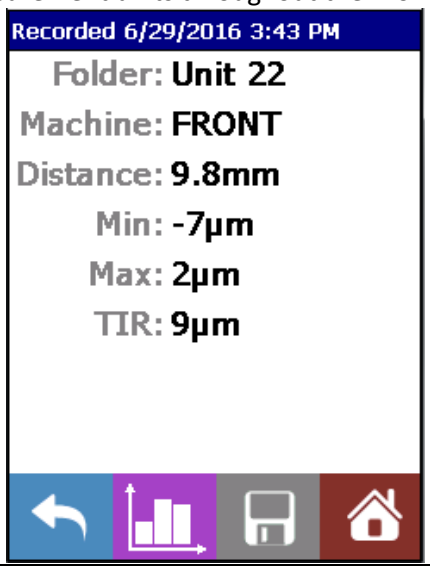
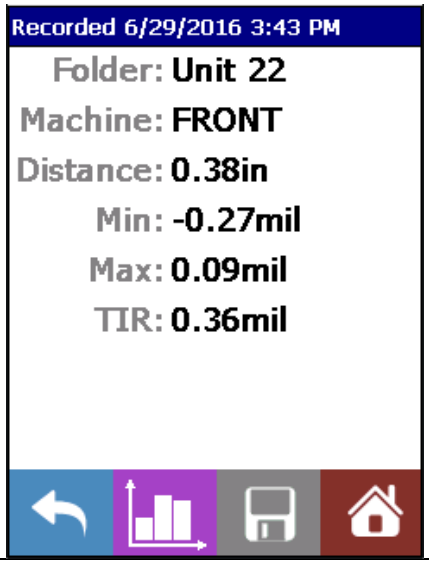
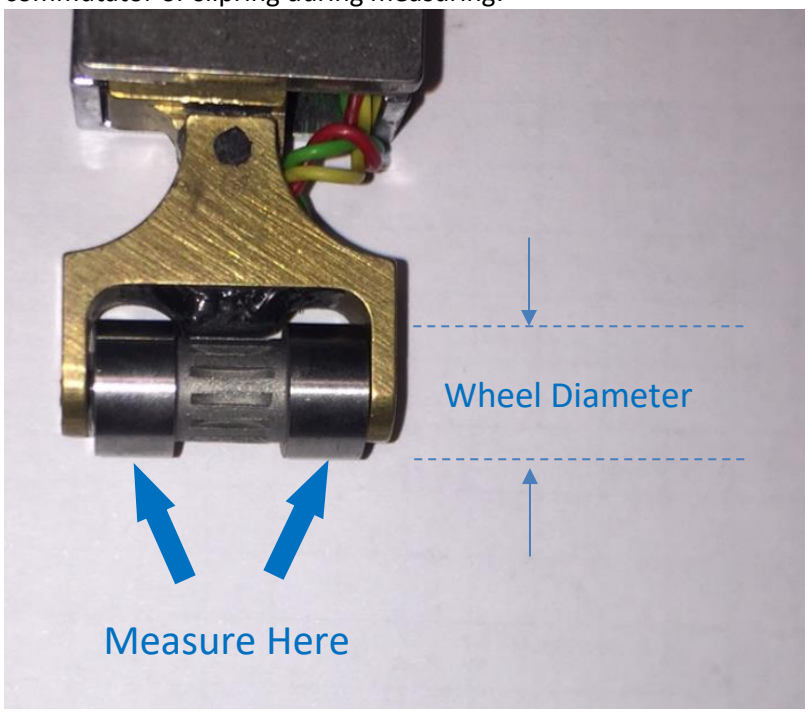
Tap the  **Options** icon to display the Options screen to review and change device settings:



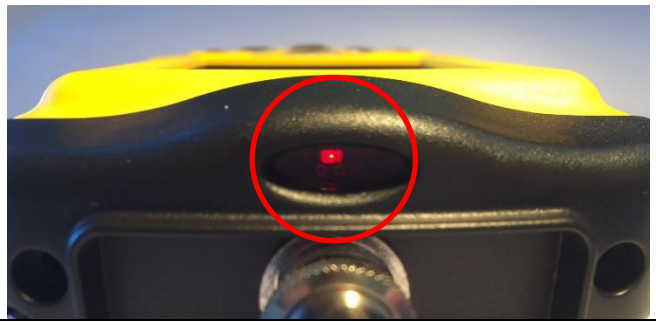
At the top of the screen is the unique Device ID number for your MMS7000. This ID cannot be changed but you may need it when contacting Profiler Tech for technical support.

NOTE: *Due to ongoing product development, the design and capabilities of the sensor electronics hardware inside MMS7000 devices has advanced over time. This means that as noted in the table below, some features are available only if the Hardware Version of your MMS7000 device (as shown on the Options → System tab) meets the minimum requirements. Contact Profiler Tech Support for more information*

Below that are tabs allowing you to view and change the following settings:

Tab	Description
Preferences	The **Units** settings allows you to switch the display between metric and imperial measurement units throughout the Profiler7000 app e.g.  
Audio	Allows you to specify if you want an audible beep every time you tap the screen. Default is On.
Sensor	Allows you to specify details of the Profiler Sensor connected to your MMS7000: • **Wheel Diameter**: In order to provide the most accurate recordings, the Profiler7000 app needs to know the precise diameter of the wheel on the sensor you are using. This should be measured using a Micrometer or Vernier Calipers on the part of the wheel that is in contact with the commutator or slipring during measuring:  The default Wheel Diameter is 7.85mm/0.309 inches.

(continued)

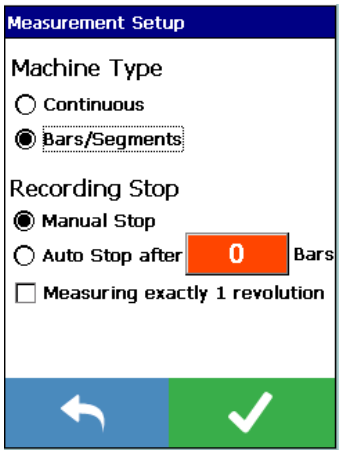
Sensor (continued)	• **Sensor Auto Off (seconds)** ***[Hardware Version 2.0 or later only]*** If the sensor remains idle for longer than the specified period, it will be automatically powered off to save battery (*it will be automatically powered back on later whenever it is required*). Note that if the sensor is powered on, a red LED will be visible in the small window above the sensor connector: 
System	Displays version and serial numbers of the various components of your MMS7000 for your reference: • **Module** ***[Hardware Version 2.0 or later only]***: the serial number of the sensor electronics hardware module inside your MMS7000. • **Software**: The version of the Profiler7000 app currently running on the device • **Hardware**: The version of the sensor electronics hardware. • **Firmware**: The version of the embedded firmware running on the sensor electronics hardware. • **Firmware Update Button** ***[Hardware Version 2.0 or later only]***: When enabled (green), new versions of Profiler7000 app will also automatically update the sensor firmware for you. You can also use this **Firmware** button to manually update the firmware to a specific version, but this should ONLY be done under the direction of the Profiler Tech Technical Support team.

When you have finished setting options, tap  to save your changes and return to the **Home Screen**.

5. Taking Recordings

Connect the Profiler Tech Displacement Sensor to the connector on the top of the MMS7000 device. Ensure the Plug and Socket key aligns before tightening the locking ring.

Tap the  **Measure** icon on the main screen, and the **Measurement Setup** screen will be displayed:



The Measurement Screen allows you to change the following settings:

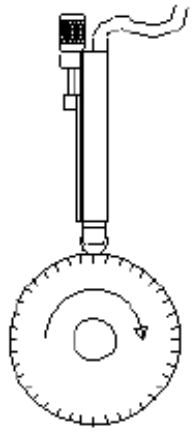
Option	Description
Machine Type	
Continuous	Allows you to specify if the machine you are measuring is one smooth/continuous surface (such as a slip ring).
Bars/Segments	Allows you to specify if the machine you are measuring has discrete bars/segments (such as a Commutator) This setting simply controls whether the MMS7000 device will need to detect Bar-to-Bar displacement or not.
Recording Stop	
Manual Stop	Indicates that the recording will continue until you manually stop it yourself using the Stop Recording button.
Auto Stop after - *xx* mm	Enter the Rotor circumference measurement and the MMS7000 will automatically stop the recording at this dimension. ***Note:*** *The maximum measuring distance currently supported by the MMS7000 corresponds to a single revolution of a rotor with a 2m (6.5 feet) diameter, which is ~6.3m (20.4 feet)*

xx Bars	Specify how many Commutator bars/segments and the MMS7000 will automatically stop the recording at the specified number of bars.
Measuring exactly 1 revolution	Check this box if you plan to rotate the commutator through exactly one revolution. If this option is checked: • If you also specify a value for "Auto Stop after" (above), you will have the option to display the recording as a Radial plot both while it is being recorded and when it is later reviewed • For Bar recordings, the MMS7000 will presume that the last bar measured is physically adjacent to the first bar, and so will compare their heights when calculating MBTB. Uncheck this option if you intend to measure more (or less) than exactly 1 revolution. The option to view the recording as a Radial plot will not be available, and for Bar recordings the MMS7000 will not include the height difference between the first and last bars when calculating MBTB

Tap  to continue to the **Position Sensor** screen.

6. Position Sensor

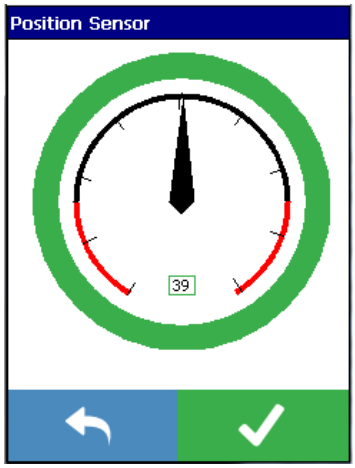
Remove the sensor from its protective metal sleeve and position it squarely in a brush holder on the machine to be measured. For greatest accuracy, the rotor must be rotated from the clamp side to the rear of the sensor, as shown on the right.



Since the sensor is usually smaller than the brush assembly, you will need to insert packing material at the front and back of the sensor to take up the available space in the brush holder. This can be either the spacer kit supplied in the kits (as shown to the left), scrap plastic or Teflon etc offcuts, or any other suitably hard material you have available.

Once you have taken up all the spare space in the holder, secure the sensor in position by lightly tightening the clamping knob.

***DO NOT** clamp the sensor with a mechanical clamp: this may cause crush damage to the internal electronics.*



NOTE: If measuring a machine with discrete Bars/Segments, it is important that the first few bars are measured correctly as these initial bars help tune the detection algorithm for the rest of the recording. For best accuracy, please ensure that the recording starts with the sensor positioned in the middle of a bar face, and that the starting bars have good surface condition and have no high mica

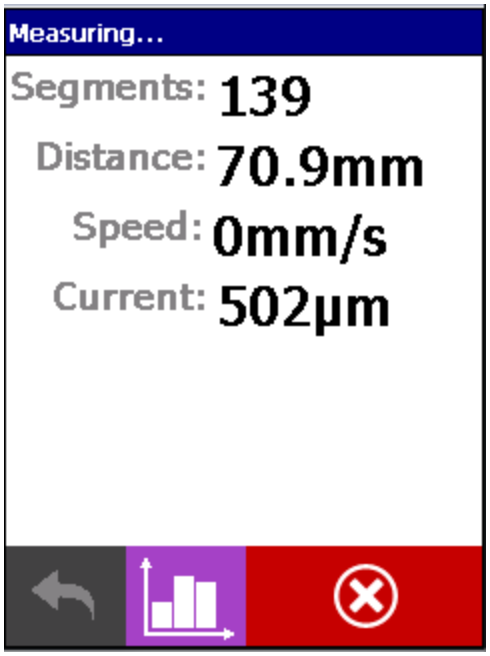
Once the sensor is mounted, use the dial gauge indicator on the **Position Sensor** screen to fine-tune its position so that the indicated Displacement is as close to zero (the sensor's midpoint) as practical, then tighten the clamp.

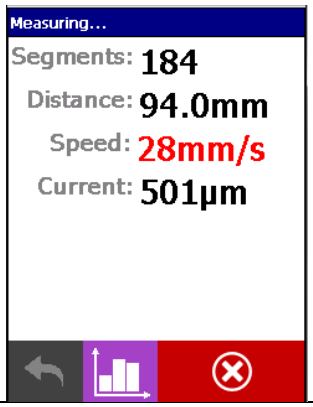
The displayed value does **not** need to be exactly 0 to give accurate results, and an acceptable position will be indicated by a dial indicator having a green surround, whereas yellow and red indicate poor positioning.

Once the sensor is positioned, tap  to continue to the **Measuring Screen.**

7. Measuring

Once the sensor is in position, tap  to start recording. Slowly rotate the rotor being measured, and the profile data will be displayed on the screen as described below:



Option	Description
Segments	The number of displacement samples the MMS7000 device has taken so far. A sample will be taken for every ~0.5mm of travel around the machine circumference, although this will vary slightly depending on the sensor wheel diameter entered in Section 4: **Setup Options****.**
Distance	The distance the sensor has travelled around the surface of the rotor so far.
Speed	The current speed of the sensor wheel as it travels around the rotor. If the Speed value is displayed in red, this indicates you are rotating the machine so quickly that the sensor is acquiring profile data faster than the MMS7000 can update the display. If this happens, simply slow down the rotation until Speed returns to being displayed in black and then continue with your recording – no profile data will be lost 
Current	The current sensor displacement, relative to the 0 point of the start of recording
Bars	*[For Bars/Segments recordings only]* Total number of bars counted so far ***NOTE**: When recordings Bars/Segments, the adaptive nature of the bar detection system will cause the MMS7000 display (including Bar Count) to lag behind the physical position of the sensor by approximately 2.5mm (1/10th inch).* *To ensure the recording includes the final bar in the recording, either:* *- Ensure that the sensor wheel has travelled at least 2.5mm (1/10th inch) past the gap after the last bar you want to measure before you stop recording, or* *- Simply use the "Autostop" feature to have the MMS7000 continue recording until it detects the desired number of bars and then automatically stop.*

During recording you can cycle through different ways of displaying the live profile data:

- Tap  to show a Line or Bar graph (depending on whether you are taking a Continuous or Bar recording)
- Then tap  to view the profile as a Radial plot.

  Note:

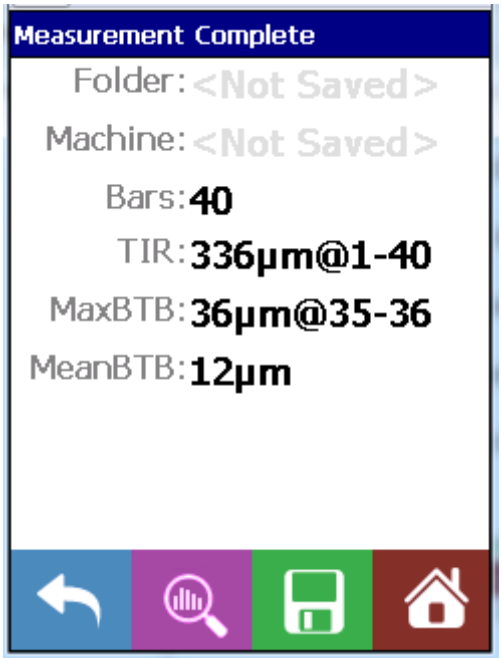
  - *The Radial plot view is only available if you have entered a value for "Auto Stop after" on the Measurement Setup screen prior to starting the recording, as this distance is used to correctly determine how far through the full 360 degrees the recording currently is.*

- *Drawing the Radial plot in real-time is very resource intensive on the MMS7000 handheld and so you may notice some amount of lag updating the display when using it, especially for fast and/or long recordings, but note that no data will be lost.*

- Finally, tap  to return to the original display showing numeric values.

To stop the recording, tap  , or if using **Auto Stop**, simply continue measuring: the recording will automatically stop once the pre-set number of Bars or Distance has been recorded.

8. Measurement Complete



Once the measurement is complete the data is displayed on the screen as described below:

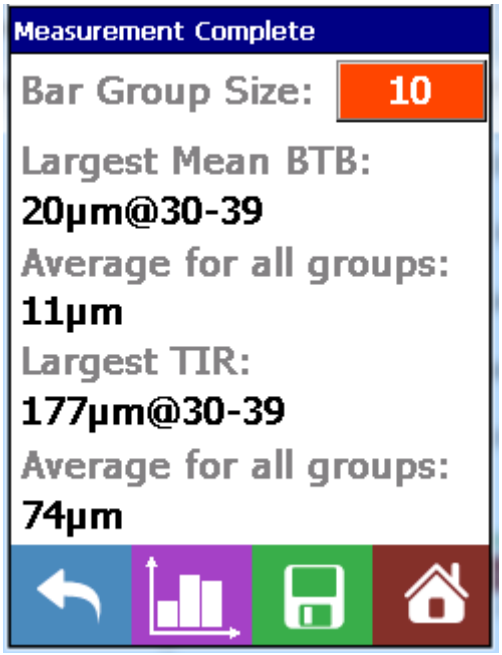
Option	Description
Distance/Bars	*For Continuous recordings*: the total distance the sensor wheel travelled during the recording *For Bar recordings*: the total number of bars counted during the recording
TIR	The **Total Indicated Runout**, the displacement difference between the highest and lowest measured points on the machine surface.
[For Bar recordings only]:	
MaxBTB	The **Maximum Bar-To-Bar** displacement, which is the largest displacement difference between any two adjacent bars in the recording.
MeanBTB	The **Mean Bar-To-Bar** displacement, which is the average/mean displacement difference between each pair of adjacent bars.

You can now select one of the following actions:

Option	Description
	Go back to the **Position Sensor** screen to take the measurement again.
	*[Bar recordings only]*: View the Bar Group Statistics for the recording (see below)
	View a graph of the recording that was just taken. You can pan and zoom on this recording using the Up, Down, Left, and Right keys on the keypad.
	Save the recording so it can be imported into EVOsoft desktop software for analysis and reporting
	Go back to the Home Screen **without** saving the recording.

9. Bar Group Statistics

For Bar recordings, the **Bar Group Statistics** page helps you evaluate the condition of the commutator by looking at groups of consecutive bars in the recording.



To set the bar group size, tap the **Bar Group Size** button and enter the number of consecutive bars you wish to evaluate. In the example shown above, the MMS7000 is analyzing each group of 10 consecutive bars (e.g. bars 1-10, then 2 -11, then 3-12 etc.)

(continued)

Once Bar Group Size is set:

Field	Description
Largest Mean BTB	Identifies the group of consecutive bars with the largest Mean Bar To Bar displacement difference. In this example, the 10 bars from 30 to 39 have the largest Mean BTB at 20µm.
Average for all groups	The average Mean Bar To Bar for all other groups of consecutive bars for comparison. In this example, each group of 10 consecutive has (on average) a Mean BTB of just 11µm, meaning the group from bars 30 to 39 is almost twice the average for this commutator.
Largest TIR	Identifies the bar group with largest Total Indicated Runout i.e. the largest difference between tallest and shortest bar. In this example, this is also bars 30 to 39 with a TIR of 177µm
Average for all groups	The average TIR for all other groups of consecutive bars, which in this example is 74µm. This means that bars 30 to 39 have a runout almost 2.5 times higher than other groups.

10. Re-Record Profile

To re-measure, tap  to return to the **Position Sensor** screen ready to measure another profile.

11. Save Recordings

Tap the  **Save** Icon to continue to the **Save Recording Screen.**

The saving options are displayed on the screen as described below.

Option	Description
User	Select the name of the User who took the recording from the list.
Folder	Select a Folder from the list, or tap in the Folder field and then tap  to enter a new Folder name

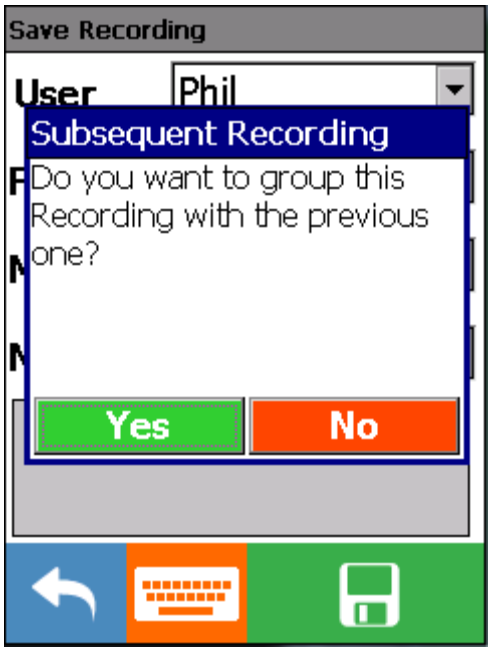
Machine	Select a Machine from the list, or tap in the Machine field and then tap  to enter a new Machine name
Notes	Select an existing Note from the list, or tap in the Notes field and then tap  to enter a new recording Note. If you enter a note and tick the 'Add this note to the List' checkbox, you Note will be added to the list and be available when saving future recordings

The items in the Users, Folders, Machines, and Notes lists are able to be defined and edited in EVOsoft. (See the User Names and Recording Notes sections, below)

Once the Folder and Machine details are selected, tap  to **Save** the data.

12. Creating a Group of Recordings

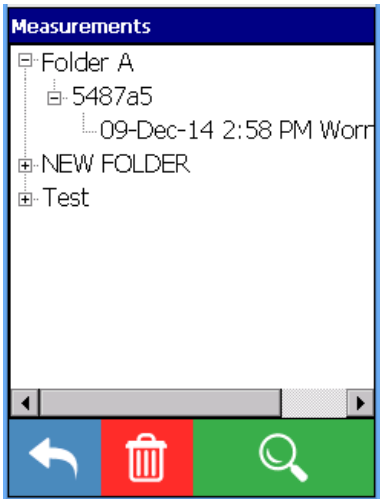
When saving a recording for the same Folder and Machine as the previous recording, you are offered the option of grouping the 2 recordings together:



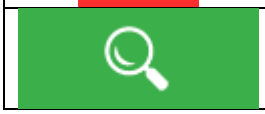
If you select Yes, then the recordings will be grouped together so that whenever you display one of the recordings later in EVOsoft, the other(s) will automatically also be shown on the same plot. This is useful when you are recording multiple tracks on the same rotor.

13. Reviewing Recordings

Tap the  **Review** icon on the main screen and the list of Recordings stored on the device will be displayed.



Saved recordings are displayed by Folder, Machine name and Date stamp.

Option	Description
	Go back to the Home Screen
	Tap on a Recording timestamp and then tap this button to delete this recording.
	Tap on a Recording timestamp and then tap this button to view the details of the selected recording

14. Upgrading the Profiler7000 App

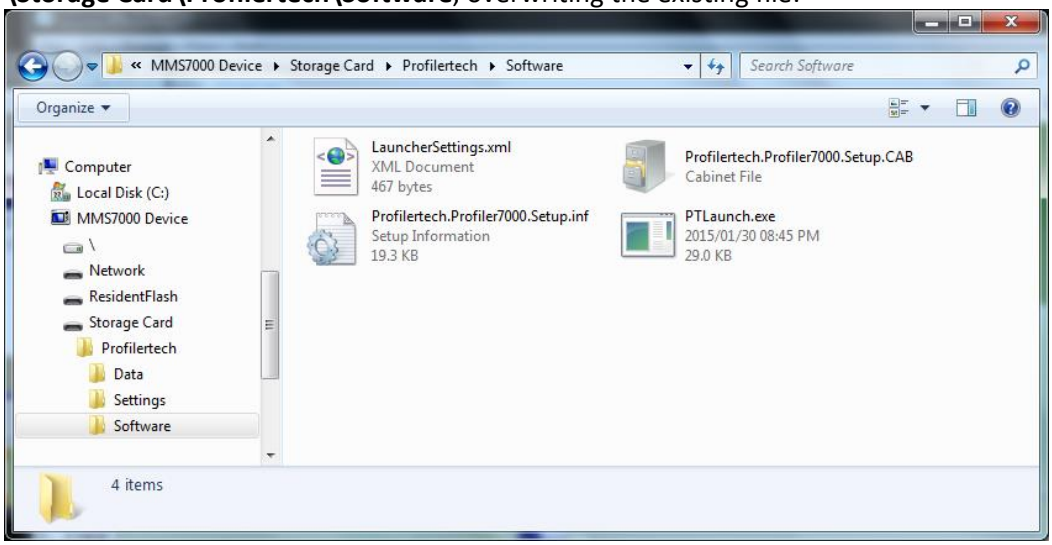
Profiler Tech periodically makes new versions of the Profiler7000 app publicly available at www.profilertech.com, and these new versions can be applied to any MMS7000 device at no charge.

***NOTE:** While updating the Profiler7000 app should not result in any loss of data, it is **strongly recommended** that you import all recordings stored on the device into EVOsoft **before** updating the app.*

The version of the Profiler7000 app you currently have installed is shown on the **Options → System** tab. Installers for new versions of the Profiler7000 app are provided in standard Windows .zip files named **Profilertech.Profiler7000.Setup.vX.X.X.X.zip,** where **X.X.X.X** indicates the version number e.g. **Profilertech.Profiler7000.Setup.v3.7.1.1.zip**

To upgrade your instrument with a new version:

1. Download the .zip file for the required version and save it on your PC e.g. on the Desktop.
2. Extract the single **Profilertech.Profiler7000.Setup.CAB** file contained in the .zip file and save it somewhere on your PC.
3. Connect your MMS7000 to your PC and copy this .CAB file to **\Storage Card\Profilertech\Software**, overwriting the existing file:



4. Once saved in this location, perform a hard reset of the MMS7000 by pressing both the power button and the corresponding button on the other side of the device for 3 seconds until the display turns completely white, then release the buttons and wait for the re-boot to complete.

After the MMS7000 reboots, the new version of the Profiler7000 app will be automatically installed and the device should now be ready for use.

EVOsoft Analysis Software

15. Installing EVOsoft

The installer for EVOsoft is provided on the USB Memory Stick supplied with your MMS7000. Installers are supplied in a standard Microsoft Windows .zip file named **EVOsoft.Setup.v*X.X.X.X*.zip,** where ***X.X.X.X*** indicates the version number e.g. **EVOsoft.Setup.v3.6.23.2.zip**.

Each such .zip file contains a single standard Microsoft Windows .msi Installer file with the same version number e.g. EVOsoft.Setup.v3.6.23.2.zip contains EVOsoft.Setup.v3.6.23.2.msi.

To install:

1. Extract the .msi file from the .zip file and save it somewhere on your PC e.g. on the desktop
2. Double-click the .msi file and follow the instructions to complete the installation

To start EVOsoft, double-click on the desktop icon or manually start the program in:

Start → All Programs → Profiler Tech Ltd → EVOsoft

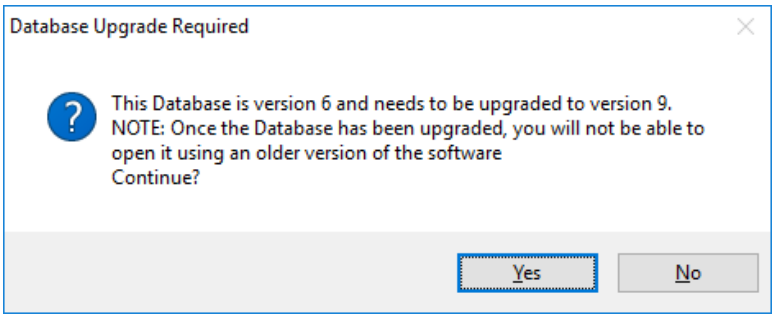
16. Upgrading EVOsoft

Profiler Tech also periodically makes new versions of EVOsoft publicly available at www.profilertech.com, and these new versions can be installed by any user at no charge.

NOTE: *While updating EVOsoft should not result in any loss of data, it is* ***strongly recommended*** *that you make a backup of your EVOsoft databases prior to installing the update (see the Database Backup section, below)*

To upgrade EVOsoft on your PC, follow the instructions in the Installing EVOsoft section, above, and your existing EVOsoft installation will be updated to the new version.

Some new versions of EVOsoft include changes to the underlying database and if so, the first time you open an existing database after installing an update you will be prompted to upgrade it e.g.:



Simply click 'Yes' to upgrade the database as required, but note that once this is done, you will **no longer** be able to open that database with older versions of EVOsoft.

17. Installing Device Communication Utilities

Before EVOsoft can communicate with your MMS7000 device, standard Microsoft device communications utilities must be installed on your PC. The specific utility required will vary depending on which version of Microsoft Windows you are using:

- For Windows XP: Microsoft ActiveSync 4.5
  http://www.microsoft.com/en-nz/download/details.aspx?id=15
- For Windows Vista, 7, & 8: Microsoft Windows Mobile Device Center 6.1
  https://www.microsoft.com/en-nz/download/details.aspx?id=14
- For Windows 10: Microsoft Sync Center should be automatically enabled and configured for you when you first connect the MMS7000 via USB cable, although this may take a few minutes and your PC will require an internet connection.

The standard Microsoft installers for these products are included on the USB Memory Stick supplied with your MMS7000. Alternatively, the installers (along with supporting documentation from Microsoft) can be downloaded at the links above.

18. Activating your EVOsoft License

EVOsoft can be freely installed and used without a licence in limited Trial mode, although a number of key functions will be disabled such as importing data from existing EVOsoft and Commtest Profiler MAS databases, as well as exporting data to other EVOsoft databases. A valid EVOsoft license is required to unlock these functions and this is included with the purchase of all new MMS7000 instruments. Your EVOsoft licence serial number will be emailed to you by Profiler Tech Support, and is in the format of a sequence of letters and numbers, similar to the below:

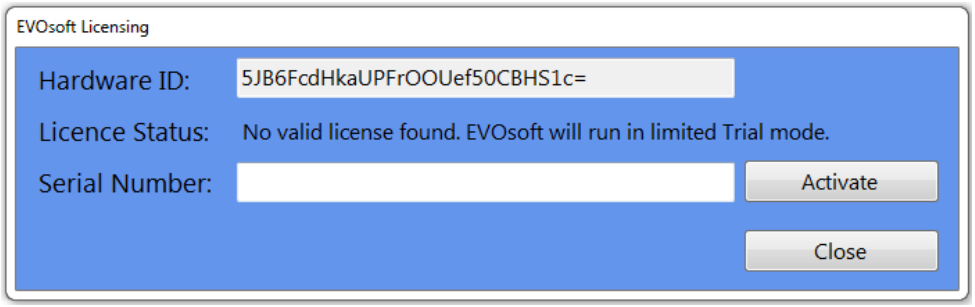
1F25-8C5F-C26D-4246-AA08-9D1C-2837

[Note that the number above is an example of the format only: your specific licence serial number will be supplied with your MMS7000 Kit]

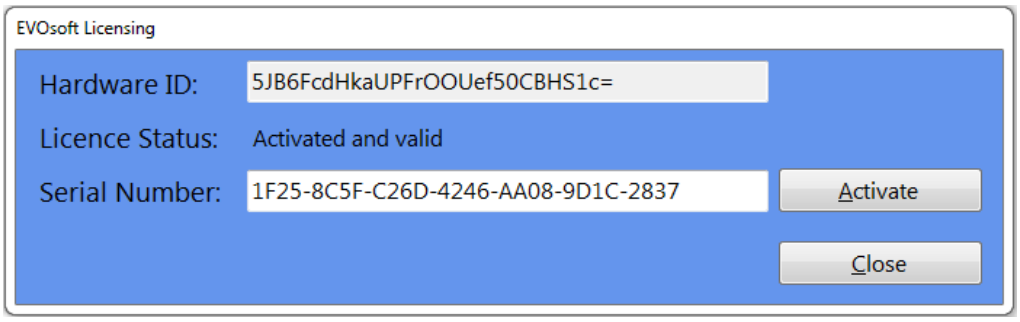
Before you can use your EVOsoft license you need to install and then Activate it on your PC. Your license will come with 3 Activations, meaning you can use it on up to 3 different PCs.

To activate your EVOsoft license on a PC:

1. Ensure your PC is connected to the internet: while EVOsoft does not require an internet connection during normal operation, a connection is required for this initial license activation. Contact Profiler Tech Support if this is not possible for you.
2. Start EVOsoft and from the menu select **Help → Licensing…** to display the EVOsoft Licensing window, which will initially show that no valid license is installed and EVOsoft is running in Trial mode:



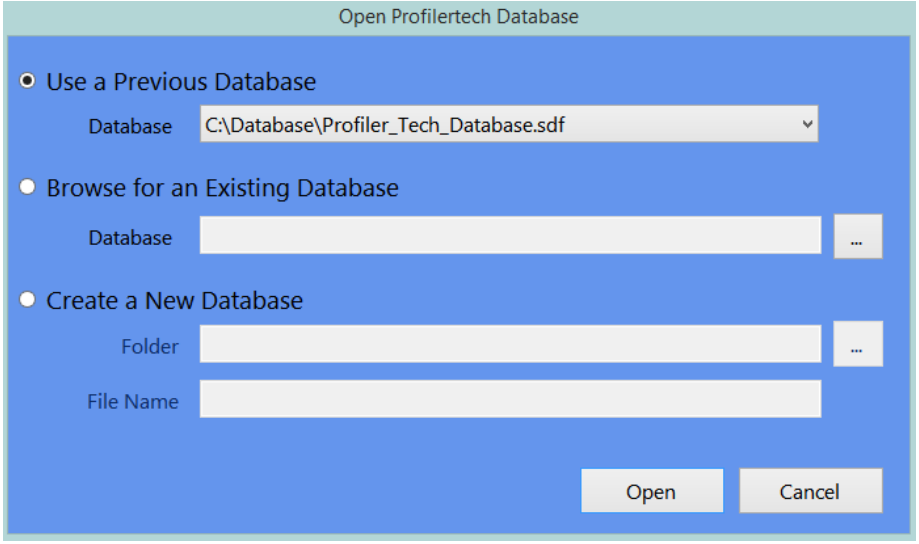
3. Enter your EVOsoft license serial number in the Serial Number field, then click **Activate**.
4. If the license is activated OK, the EVOsoft Licensing window will close and you will be returned to the main page. If you receive any sort of error that you are unable to resolve, contact Profiler Tech Support.
5. To verify your license status at any time, select **Help → Licensing…** to display the EVOsoft Licensing window again, which should appear similar to the following:



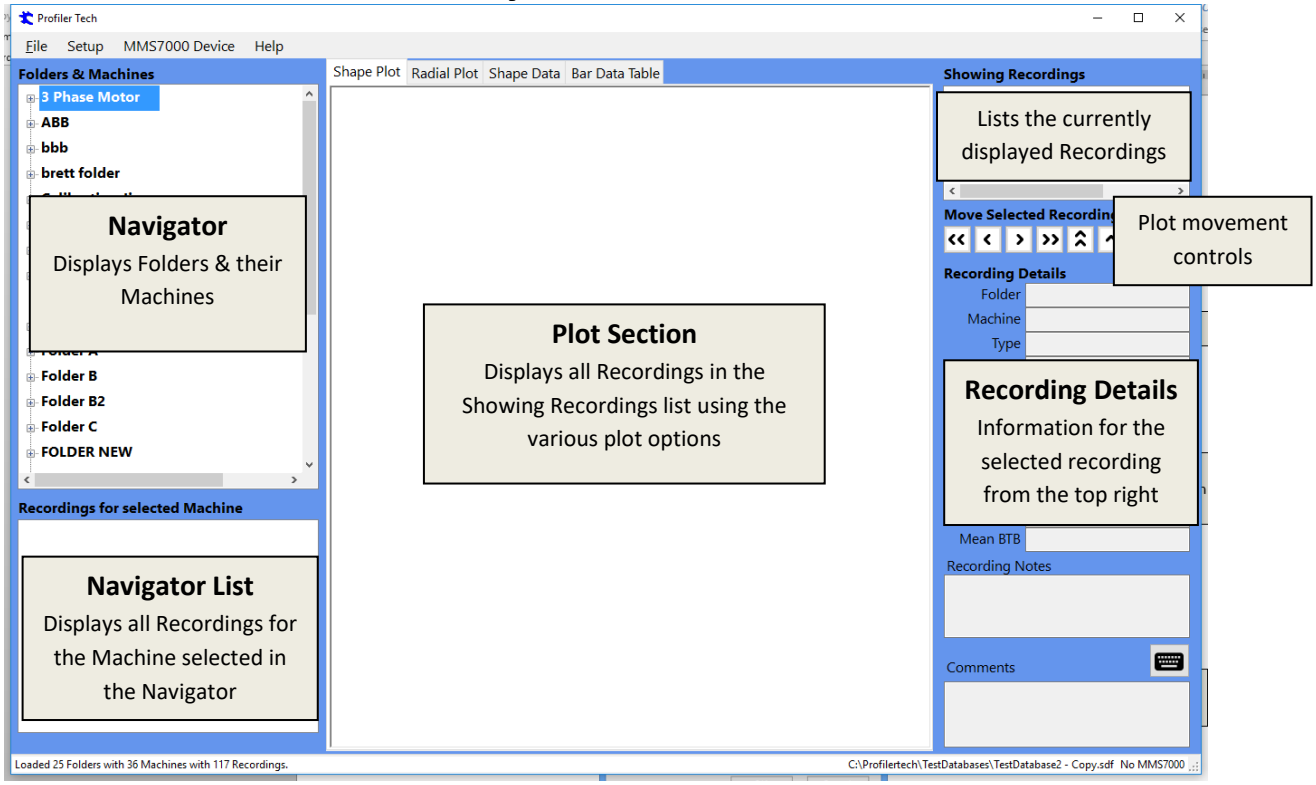
19. Create Database

To commence using EVOsoft, you must first create a database.

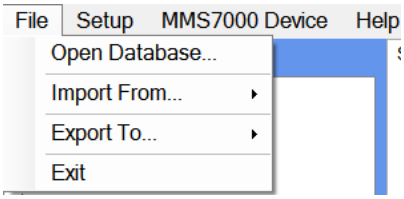
Select **Create a New Database,** browse to the preferred Folder Location and enter the File Name of the new database.
Select **Open** to create the database.
Once a Database has been created, it can be selected from the dropdown option in:
Use a Previous Database or use **Browse for an Existing Database** to select.



20. EVOSoft Software layout



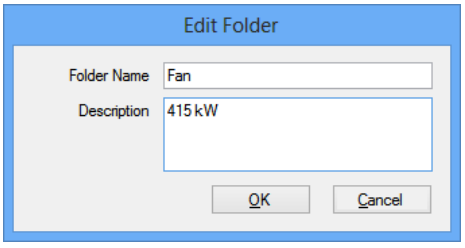
To select another Database, click **File,** select **Open Database** and browse to the file location.



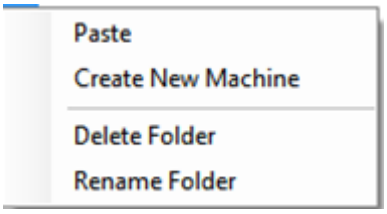
21. Folders & Machines

A database can contain multiple folders, each folder can contain multiple machines, and each machine can have multiple recordings.

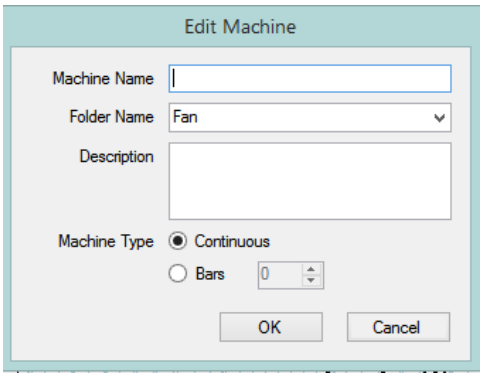
Right click in the Navigator Window to create a new Folder. Enter the Folder details and select OK. Enter a description if required.



To add a new Machine to the Folder, Right Click on the Folder and select **Create New Machine**.



You can enter the Machine name, a description and information on the machine type – Continuous or the number of Bars.



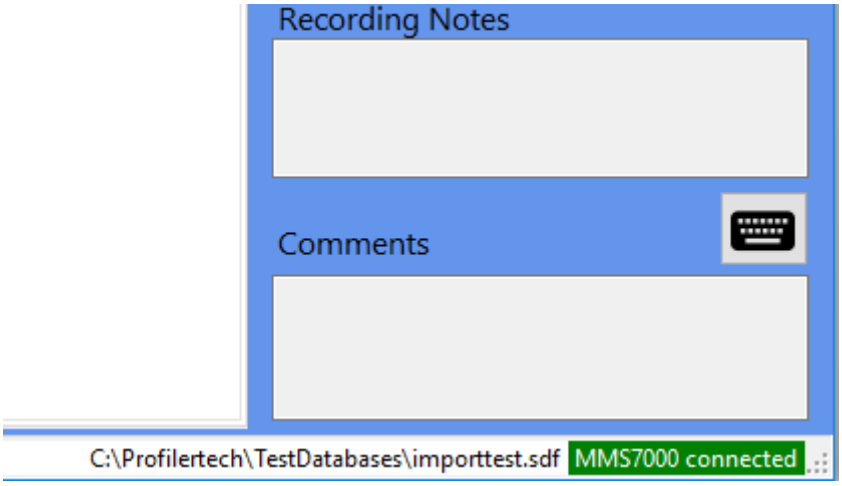
You can also copy an existing Machine to a different Folder:

1. Right click on the Machine you want to copy and select Copy Machine. If this Machine also has some recordings attached to it, you can choose to also copy these as well if desired.
2. Right-click on the Folder you wish to create the copy in, and select Paste Machine.

22. MMS7000 Communications

Connect the USB Comms cable between the MMS7000 and USB port of the PC. The MMS7000 should automatically connect to the EVOsoft software.

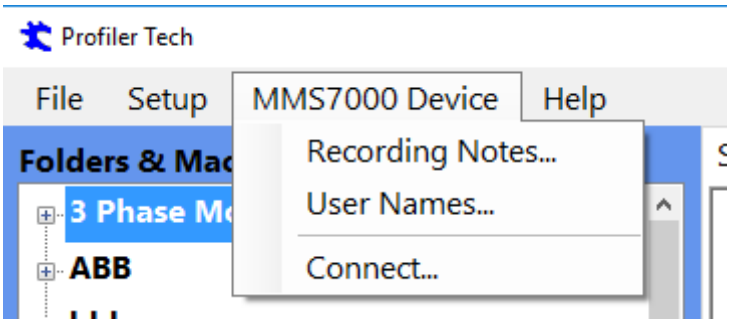
Once connected a green confirmation message will appear in the bottom right hand corner.



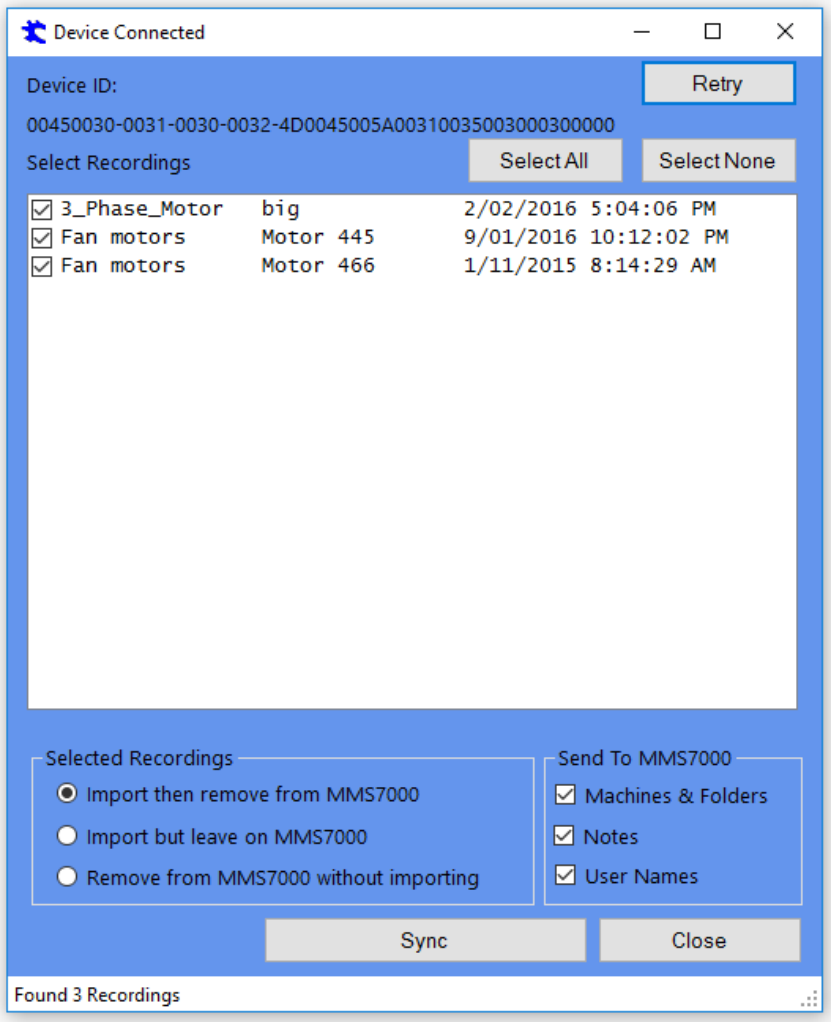
If EVOsoft is unable to detect that your MMS7000 device has been connected to the PC, consult the Troubleshooting section, below.

23. Transferring Data

Once communication is established, to transfer recorded data to EVOsoft, click **MMS7000 Device** from the Toolbar and select **Connect…**



The **Device Connected** Window will appear listing all of the profiler recordings available for download e.g.



Choose the desired recordings to be imported by selecting the checkbox.

The Device Connected window allows you to manage the Selected Recordings stored on the MMS7000 device:

Selecting…	Then pressing 'Sync' will…
Import then remove from MMS7000	Import the recordings into EVOsoft and then delete the recordings from the MMS7000 device.
Import but leave on MMS7000	Import the recordings into EVOsoft without deleting them from the MMS7000.
Remove from MMS7000 without importing	Delete them from the MMS7000 device WITHOUT importing them into EVOsoft. Once a recording is deleted like this **it cannot be recovered**, so take care to ensure that you are deleting the correct recordings.

During the synchronisation operation, you can also send other types of data to the MMS7000:

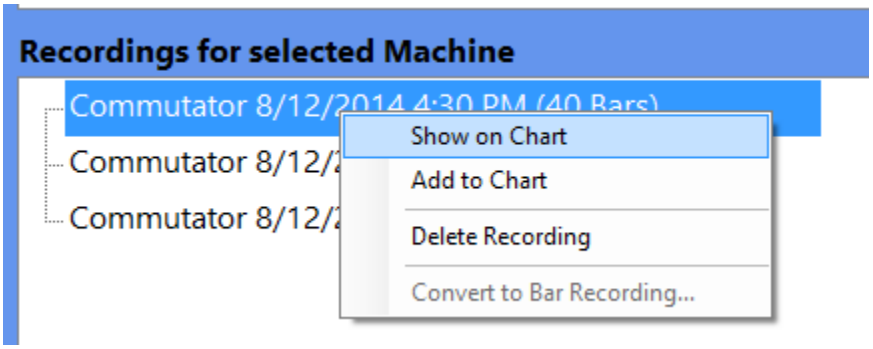
Selecting the option…	Will …
Machines & Folders	Send the list of Folders and Machines from the EVOsoft database you are currently viewing to the MMS7000 handheld.
Notes	Send the list of Recording Notes from the EVOsoft database you are currently viewing to the MMS7000 handheld. Refer to Section 32 for more details on defining Recording Notes.
User Names	Send the list of defined Users from the EVOsoft database you are currently viewing to the MMS7000 handheld.

All of the options are checked by default and all of the above information is then available to select when saving recordings on the MMS7000, as described in Section 9, above.

The entries in both lists will appear on the MMS7000 in the same sequence they appear in EVOsoft in the two displays above. To change the current sequence, select an entry and then click **Move Up** or **Move Down** as required.

24. Plot a Recording

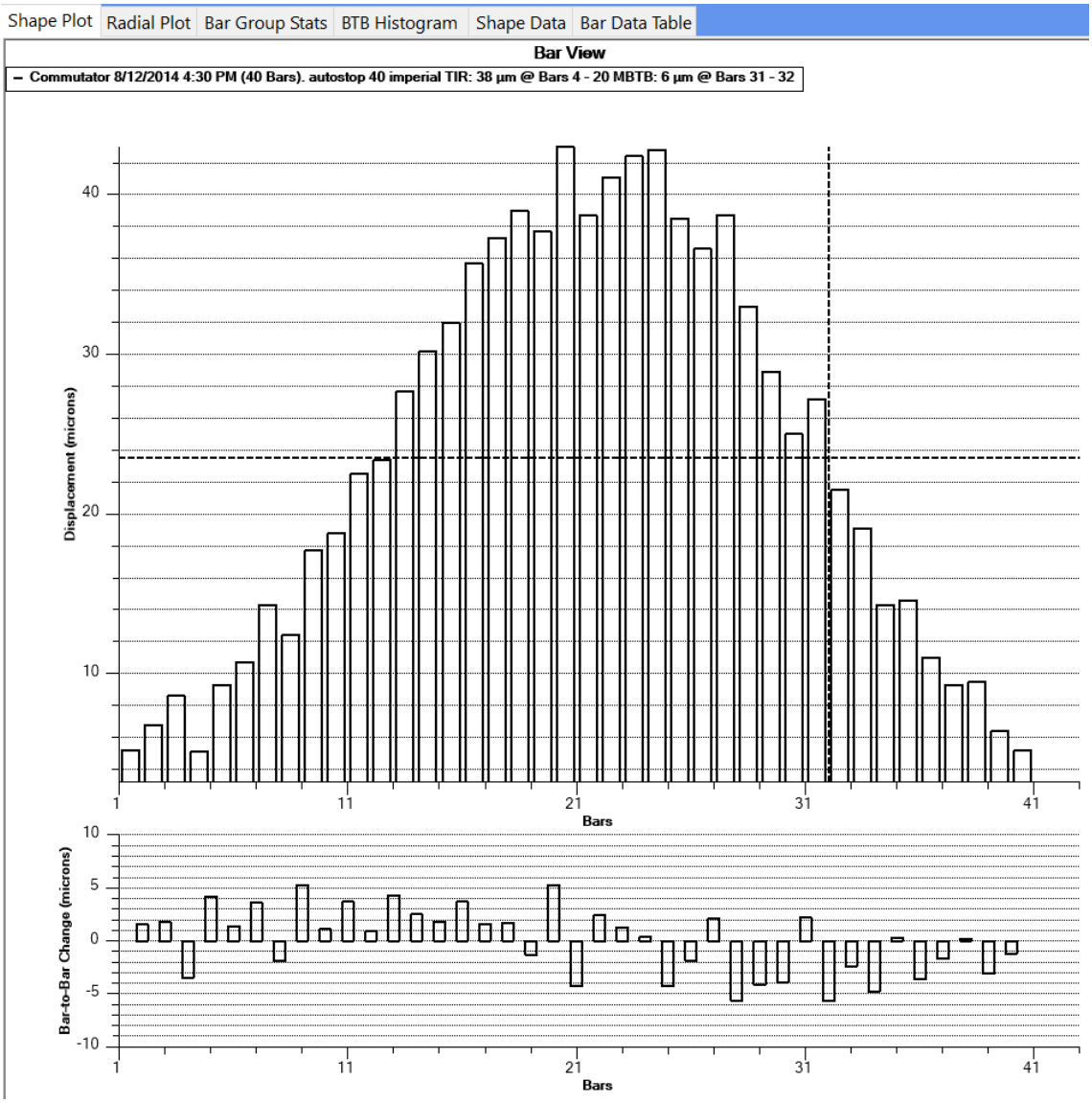
To plot a recording, simply double-click the recording in the Navigator List in the lower left corner, or right-click on the selected recording and then select **Show on Chart.**



There are six Plot types available to display the data, which are selected using the appropriate Chart Tab at the top of Plot Section. Once a profile is plotted, you can toggle through the Tabs to view the recording in each of the different Plot types.

Shape Plot

Profiles are displayed in a linear form, showing either the raw shape of the recording (*for Continuous recordings*), or the individual Bars (*for Bar recordings*).



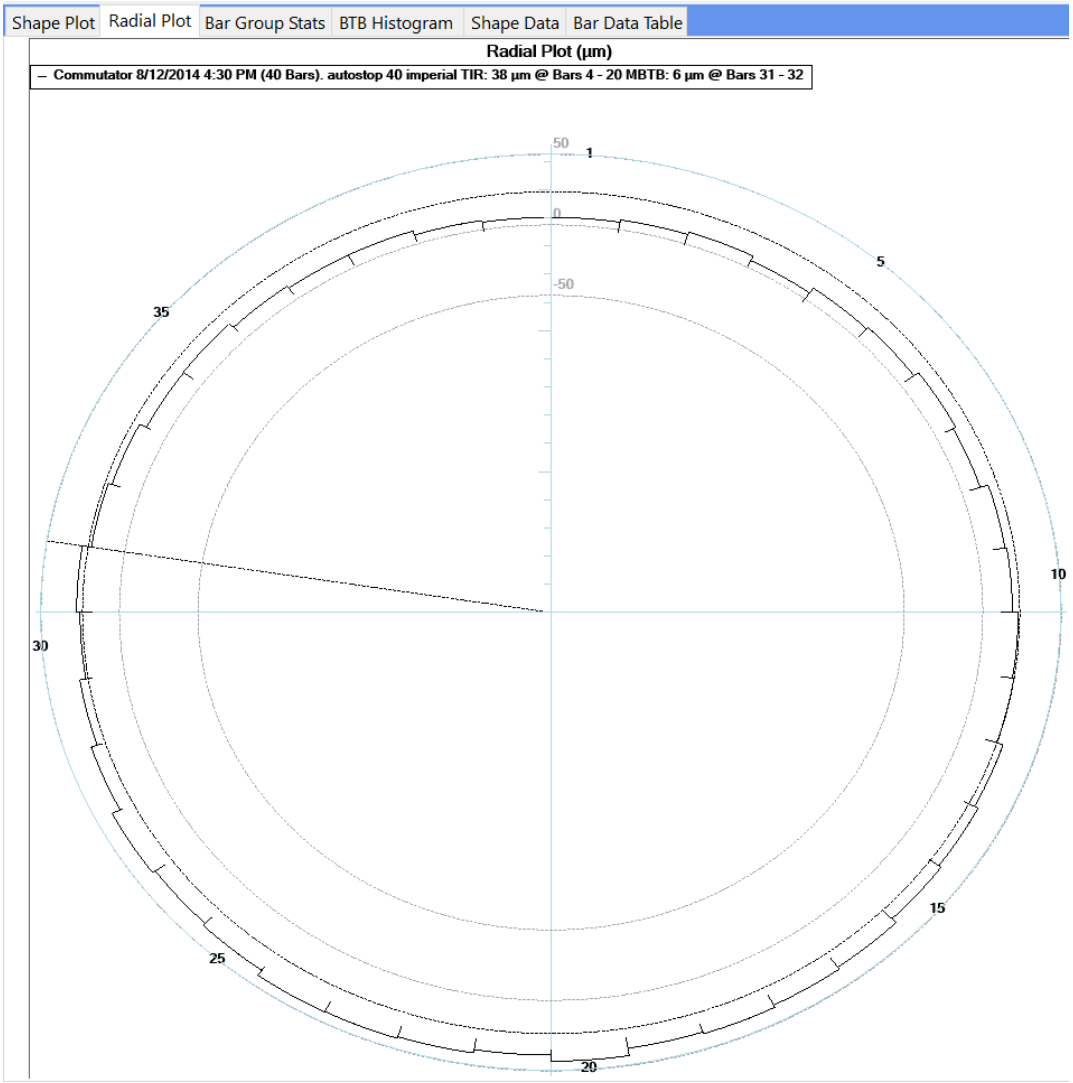
To read values from the displayed data within a Shape plot, left click on bar and hold the mouse button down. The Bar number and amplitude or position (Degrees) and amplitude will be displayed.

Below the main plot is a smaller chart that shows the Displacement Rate of Change (*for Continuous recordings*) or the Bar-to-Bar Change (*for Bar recordings*). This helps you to identify areas of the rotor where the shape is changing in an abnormal manner e.g. unusually steep upwards or downwards slope, oscillating bar heights etc.

By default, Shape Plots are drawn with a horizontal dotted line that indicates the average displacement for the recording, although this line can be turned on and off by right-clicking on the chart and selecting the **Show Average Line** menu entry. Bar Plots also include a vertical dotted line indicating the position of the MBTB value, which can similarly be turned on and off by right-clicking on the chart and selecting **Show MBTB Line**.

Radial Plot

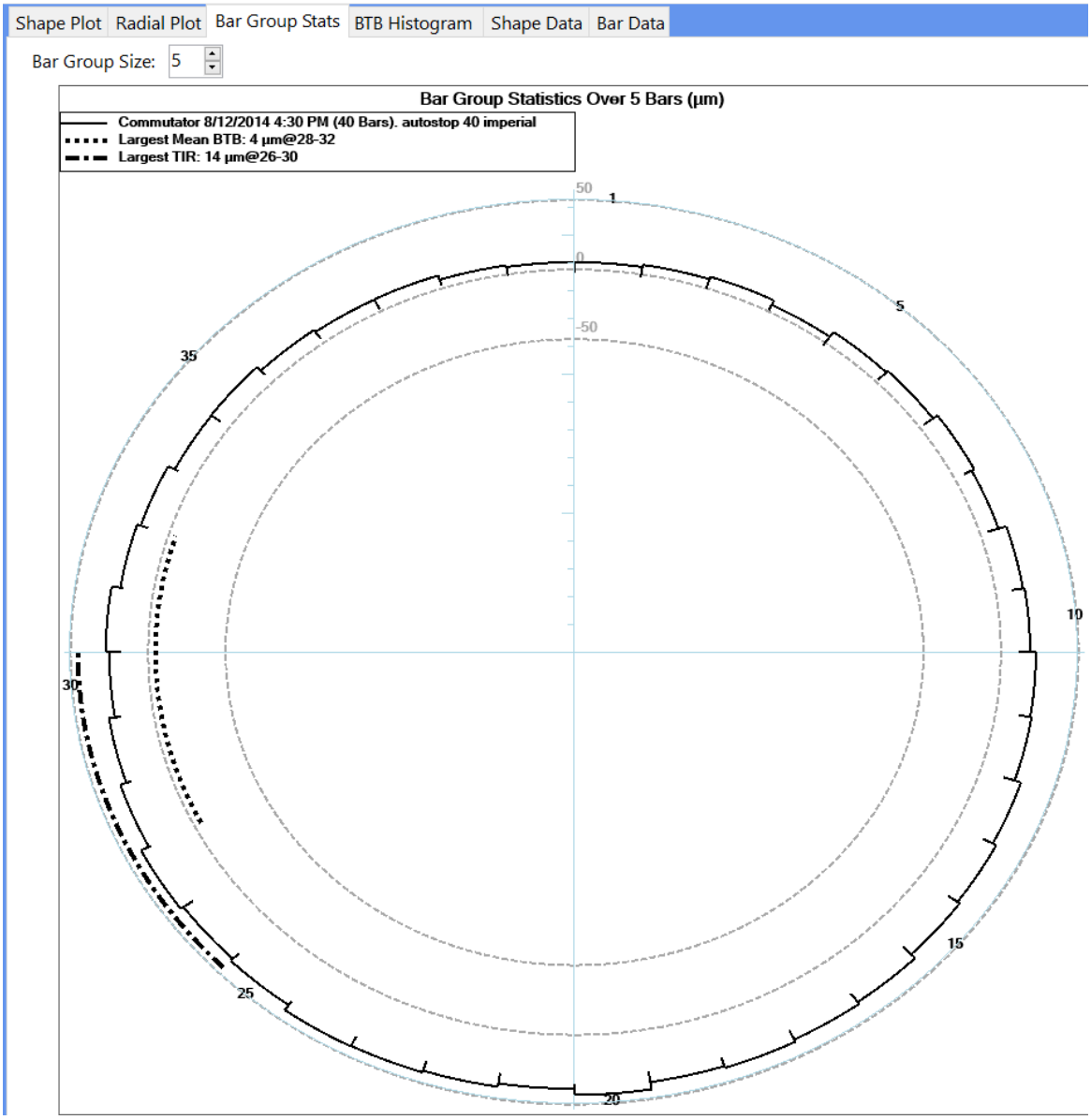
Profiles are displayed in a radial form which displays the true shape of the Commutator or Slip Ring, although with a highly exaggerated displacement to better show the detailed shape.



The upper and lower limits of the chart default to fixed values to give a consistent initial view of all rotors, but these limits can be changed as described in the Y-Axis Scaling section, below. As for the Shape Plot, Radial Plots are drawn with a circular dotted line indicating the average displacement for the recording which can be turned on and off by right-clicking and selecting **Show Average Line**. For Bar recordings, a dotted straight line indicates the position of the MBTB values which can also be turned on and off by right-clicking on the chart and selecting **Show MBTB Line**.

Bar Group Stats

Used for Bar recordings only, the Bar Group Stats plot is like the Radial Plot in that it shows the profile in a radial form, but also allows you to view statistics about each group of consecutive bars in Bar Recordings.



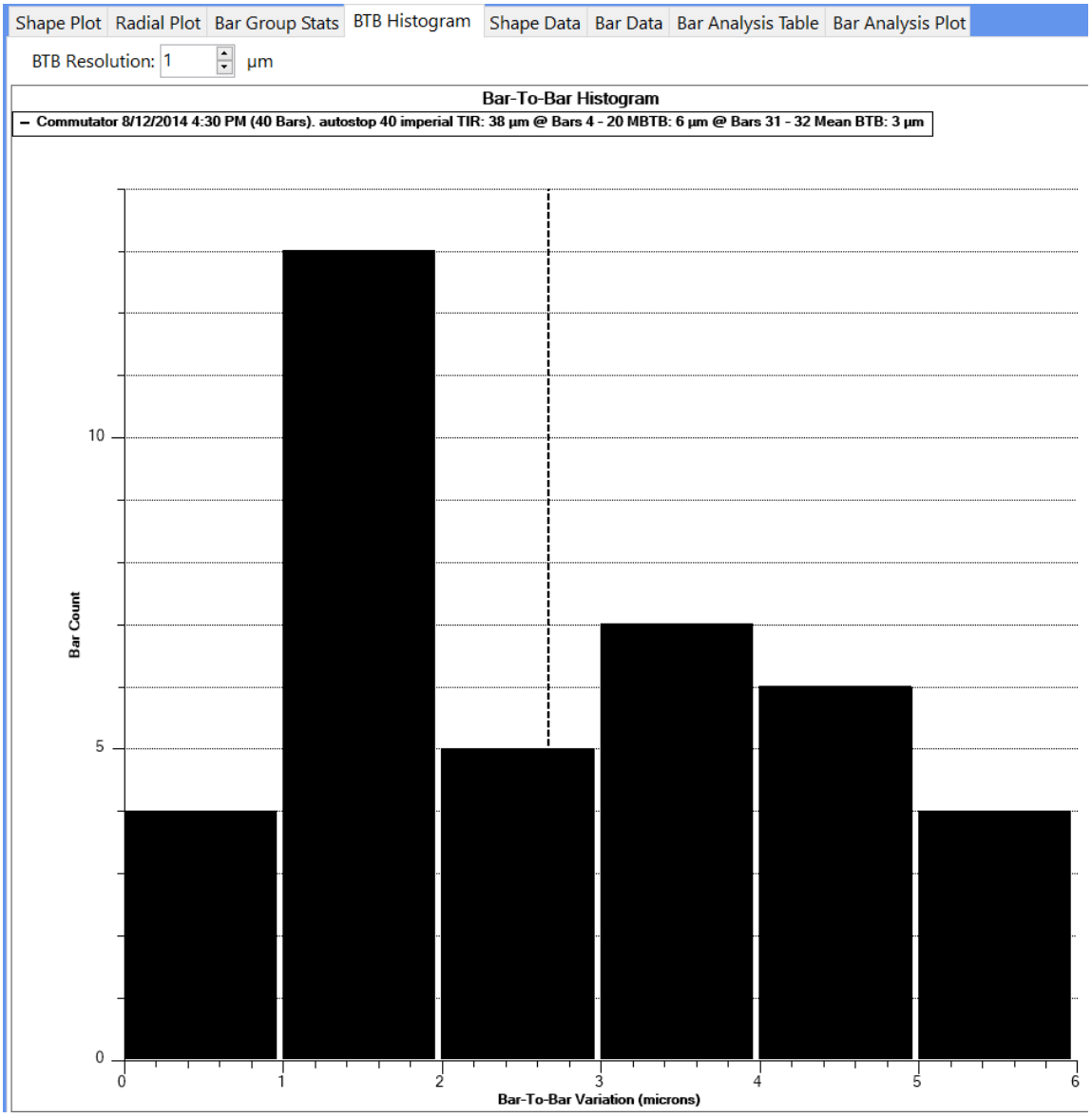
The number of bars in each group can be adjusted using the **Bar Group Size** field, and in this example it is set to 5 so EVOsoft is analysing each group of 5 consecutive bars i.e. bars 1-5, then 2-6, then 3-7 etc.

Once Bar Group Size is set, the plot then identifies which group(s) of consecutive bars has:

- The largest Mean Bar-To-Bar height difference between consecutive bars in the group (identified by the dotted line in the inner part of the plot)
- The largest Total Indicated Runout between the tallest and shortest bar in the group (identified by the dash-dot line in the outer part of the plot)

Bar-to-Bar Histogram

Used for Bar recording only, this plot summarizes the Bar-to-Bar height differences for all bars in a Bar Recording by plotting them in a histogram.



The resolution of the histogram can be adjusted using the 'BTB Resolution' field and the plot will automatically update. In this example the resolution is set to 1µm (1 micron) and for this bar recording:

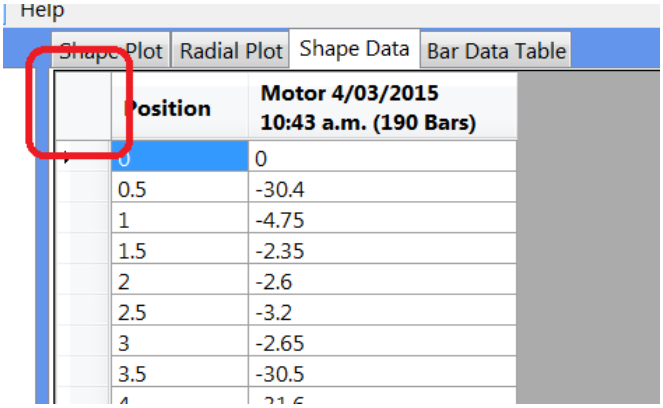
- 4 pairs of bars have a BTB difference between 0 and 1µm
- 13 pairs of bars have a BTB difference between 1 and 2µm
- 5 pairs of bars have a BTB difference between 2 and 3µm, and so on.

A vertical dotted line indicates the exact Mean BTB displacement difference, and this lines can be turned on and off by right-clicking on the chart and selecting the **Show Average Line** menu entry. Note that this line shows the exact Mean BTB displacement, whereas the Mean BTB value shown in the chart legend is rounded.

Shape Data

Displays the actual value recorded in steps of 0.5mm as the sensor travels across the surface of the rotor. This view allows you to copy the recorded data to the Clipboard so that you can paste it into other programs, such as Microsoft Excel. To do this:

1. Select all the rows of data by left-clicking in the empty cell in the very top left corner of the page



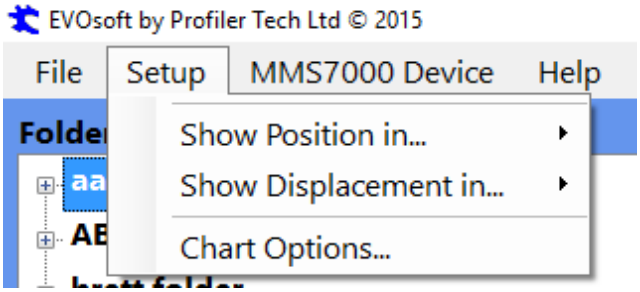
2. Right-click in this same cell and select 'Copy to Clipboard'
3. Switch to the program you want to paste the data into and use the normal Paste functionality to paste in the data

Bar Data

Displays the actual value recorded on each bar or segment. You can copy the data from this view into other programs using the same method described for 'Shape Data', above.

25. Change Default Units & Position

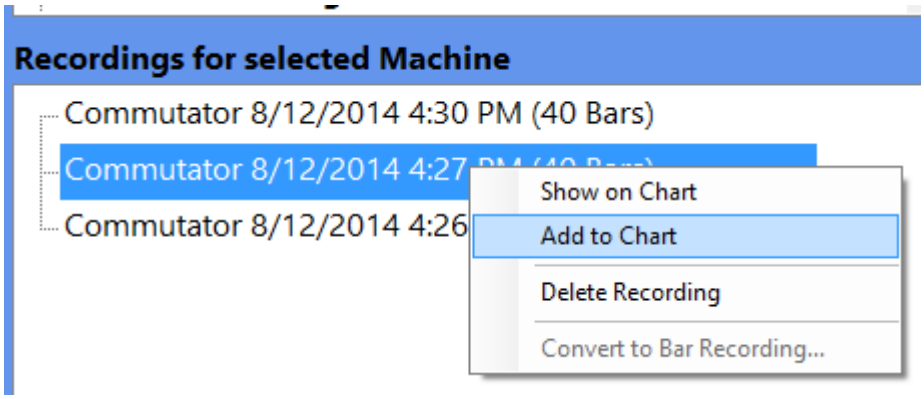
Select the **Setup** Menu to customise how you want certain things displayed:



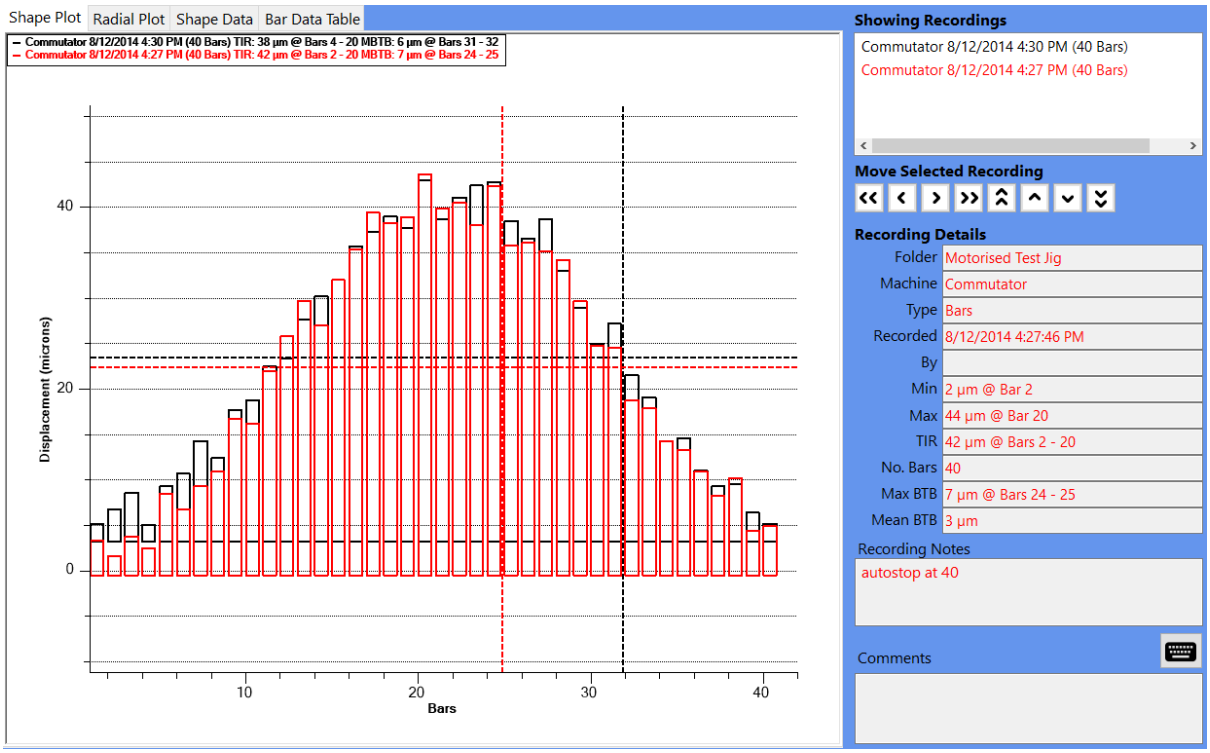
Selecting the option…	Allows you to …
Show Position In…	Specify whether the X axis on charts and other values related to the position of the sensor on the rotor will be displayed in millimetres, degrees or inches.
Show Displacement In…	Specify whether the Y axis on charts and other values related to the measured displacement (e.g. TIR, MBTB etc) will be displayed in millimetres, microns or mils (1/1000th of an inch).
Chart Options	Set the default line style and thickness for charts. Note that once a recording has been plotted on a chart, the color and style of it's plot lines can be individually adjusted as described in the following section.

26. Plot Multiple Recordings

You can add multiple recordings to a graph - right click on a recording in the bottom left and click **Add to chart.**

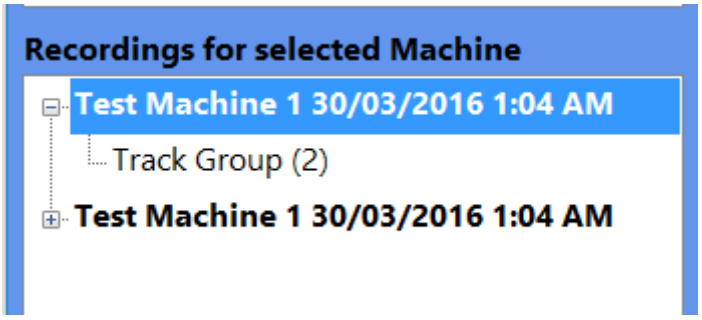


The recording will then be added to the Showing Recordings list in the top right, and the colour of its name in this list will match the colour of the corresponding line in the Plots e.g.



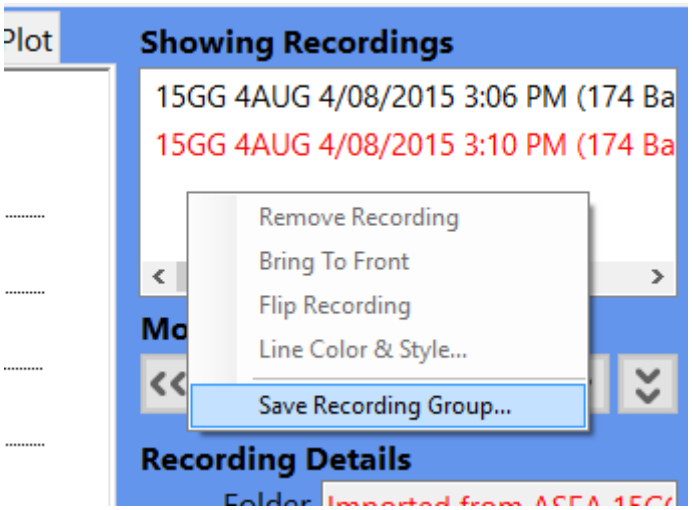
27. Plotting a Recording Group

Section 12 – “Creating a Group Of Recordings” (above) describes how to group related recordings together when using the MMS7000. Once these recordings are imported into EVOsoft, when they are displayed in the recording list in the bottom left, any recording that is in a group is displayed in **bold** text, and you can also expand the recording item in the tree to see the details of the group(s) it is in:



Double-clicking on the recording machine name & timestamp will display just the individual recording by itself as normal, but double-clicking on the Recording Group text ("Track Group (2)" in this example) will display all of the recordings in the group at the same time.

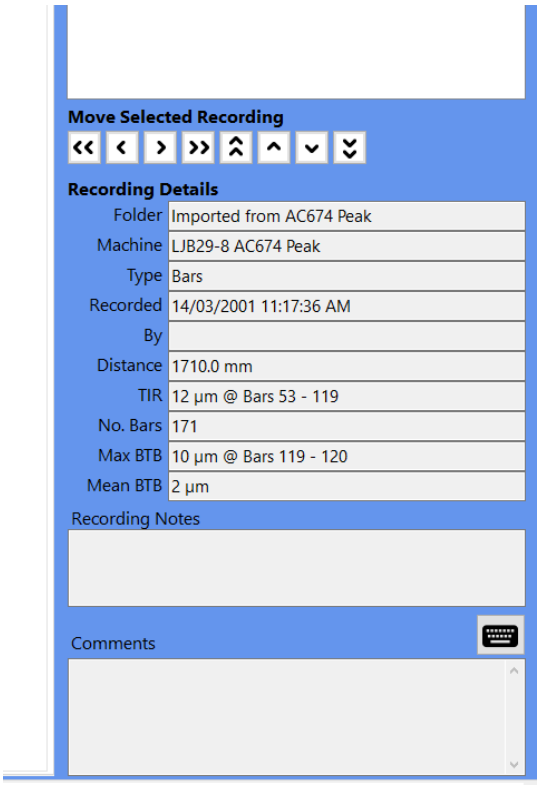
In addition to creating 'Track Groups', when recording on the MMS700, you can also manually create a 'Custom Group' in EVOsoft by manually adding & positioning recordings on the charts and then right-clicking in the 'Showing Recordings' list in the top right and selecting **Save Recording Group…**:



You can use the same method to add or remove recordings from an existing Recording Group of both types, and note that if you remove recordings from a Group such that only 1 recording remains, the Recording Group will be automatically removed.

28. Recording Information

Once a recording has been plotted, its details will be displayed in the bottom right of the display:



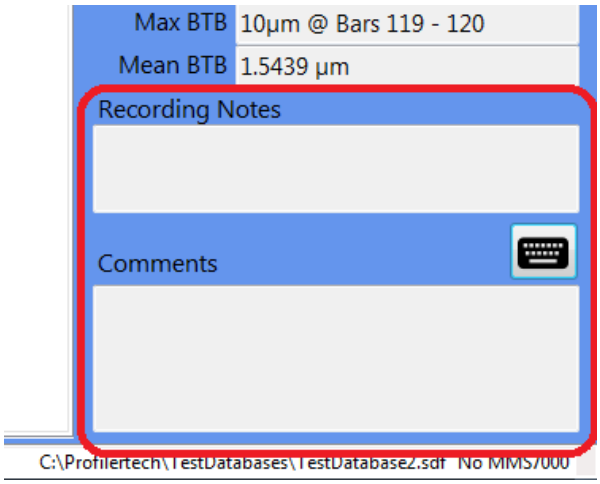
The details displayed are:

Field	Description
Folder	The Folder the recording is from.
Machine	The Machine the recording is for
Type	The Type of recording: either 'Bars' or 'Continuous'
Recorded	The date and time the recording was taken
By	If specified during recording, the name of the person who took the recording.
Min/Max	The minimum and maximum displacement measured during the recording i.e. the highest and lowest points found.
TIR	The **Total Indicated Runout**; the difference between the minimum and maximum displacement. For Bar recordings, the numbers of these highest and lowest bars is also shown. **Note**: If multiple bars share the same minimum (or maximum) displacement, then the lowest numbered bar will be shown.
For Bar recordings only	
No. Bars	The total number of bars detected
Max BTB	The **Maximum Bar To Bar** displacement; the maximum displacement difference between two consecutive bars, along with the numbers of these two bars **Note**: If multiple pairs of bars share the same Maximum BTB displacement, then the lowest numbered pair of bars will be shown.
Mean BTB	The **Mean Bar To Bar**; the average displacement difference between each pair of consecutive bars for the entire recording

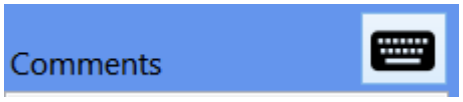
If multiple recordings are being displayed, you can choose one to display details for by selecting it in the Showing Recordings list in the top right of the display.

29. Add Comments

In the bottom right corner of the main EVOsoft display are 2 text fields containing text descriptions related to the currently select Recording:



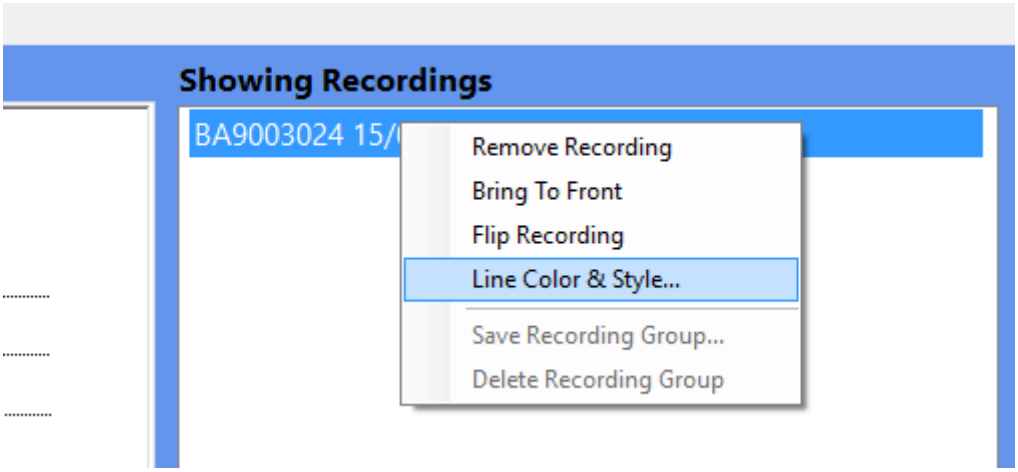
- **Recording Notes** is the text entered on the MMS7000 device when the recording was saved, as described above in the section Save Recordings, above. These Recording Notes cannot be changed in EVOsoft
- **Comments** allow the EVOsoft user to enter free-form text that is stored along with the recording. Click on the Keyboard Icon to open the Comments Window where you can add or edit recording comments



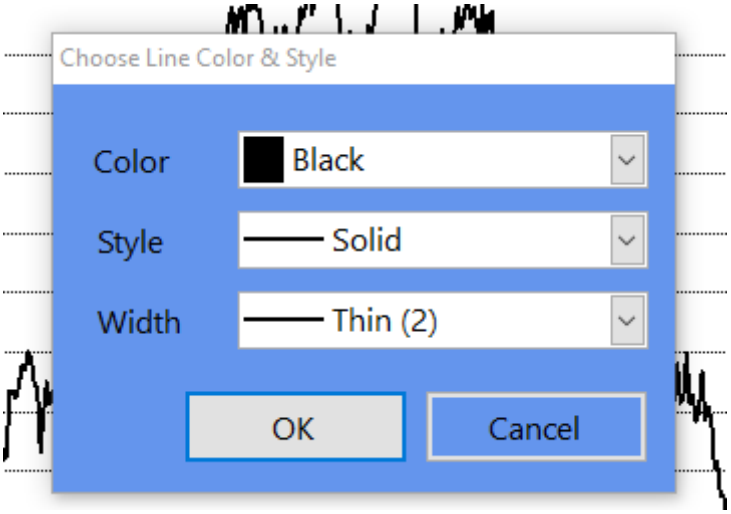
30. Altering How Recordings Are Displayed

Changing Chart Colors and Lines

When a recording is added to a chart, the corresponding plot line will use the default line style and thickness specified in the **Setup** menu (see above) in the next unused color. However, you can then adjust the color and style of this line by right-clicking on the recording in the 'Showing Recordings' list in the top right and selecting 'Line Color & Style…'



This is useful if you wish to print a chart on a monochrome printer as it allows you to set all plot lines to black and instead just assign each recording a different line style.



Moving Recordings

When displaying multiple recordings on a single plot, it is often useful to be able to adjust the position of the recordings up/down or left/right. This is most useful for aligning profiles recorded on the same machine but with different starting positions on the same plot, and is available for both Shape and Radial Plots using the **Move Selected Recording** buttons:

First choose which plot to move by selecting the Recording in the **Showing Recordings** list in the top right, then adjust its position using the 8 buttons as follows:

Button	Moves the Recording…		Keyboard Shortcut	Mouse Shortcut
	Shape Recordings	Bar Recordings		
«	Left by 10 samples	Left by 10 bars	Shift + Left Arrow	Ctrl + Shift + Mouse Wheel Up
‹	Left by 1 sample	Left by 1 bar	Left Arrow	Ctrl + Mouse Wheel Up
›	Right by 1 sample	Right by 1 bar	Right Arrow	Ctrl + Mouse Wheel Down
»	Right by 10 samples	Right by 10 bars	Shift + Right Arrow	Ctrl + Shift + Mouse Wheel Down
⌃⌃	Up by 10 microns (0.01mm)		Shift + Up Arrow	Shift + Mouse Wheel Up
^	Up by 1 micron (0.001mm)		Up Arrow	Mouse Wheel Up
⌄	Down by 1 micron (0.001mm)		Down Arrow	Mouse Wheel Down
⌄⌄	Down by 10 microns (0.01mm)		Shift + Down Arrow	Shift + Mouse Wheel Down

Zoom & Pan

Zooming is only available in Shape plots:

- **Zoom in** - Left mouse click and hold, draw a box over the target area. Release the mouse button to zoom in on the target area. You can zoom in multiple times.
- **Zoom out** – Click down on middle mouse button or click down on your scroll wheel, or right-click on the chart and select the **Zoom Out** menu entry. You can zoom out as many times as you zoomed in.
- **Pan** – The chart display can be dragged in any direction to display areas that are hidden in the current view which is especially useful once you have zoomed in. Pan the display by holding down the right mouse button and dragging the chart.

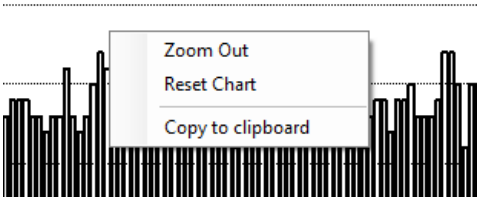
Y-Axis Scaling

In the Shape and Radial Charts you can change the Y-Axis scale by clicking on the chart and rotating the scroll wheel on your mouse. Holding down the Shift key while you scroll changes the scale faster.

Reset Chart Display

To undo all moving, zooming, panning and scaling of a chart and reset it back to its original appearance, right-click on the chart and select the **Reset Chart** menu option.

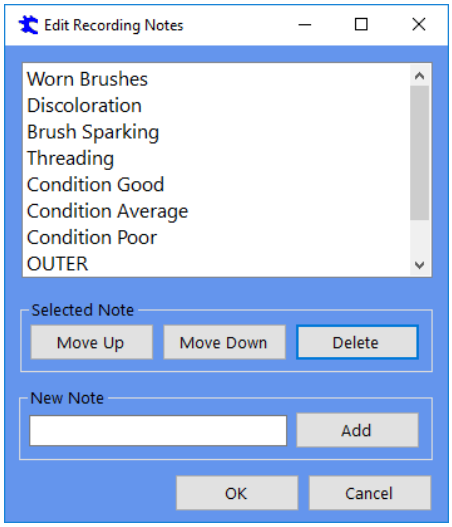
31. Copying & Printing Charts



To copy a chart to the Windows Clipboard, right-click on the chart and select **Copy to Clipboard**. Once copied you can paste the chart image into reports, documents or emails.

32. Recording Notes

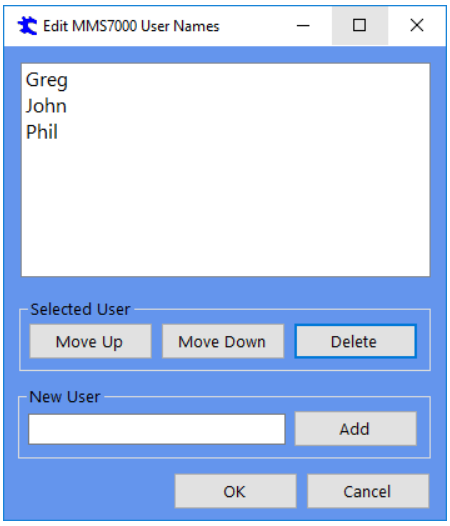
Click **MMS7000 Device** on the Toolbar and then select **Recording Notes.** Notes can be entered as a library item and easily selected when saving profile recordings on the MMS7000 device.



Notes appear on the MMS7000 device in the same sequence as they are displayed in the window above. You can use the 'Move Up' and 'Move Down' buttons to change this sequence.

33. MMS7000 User Names

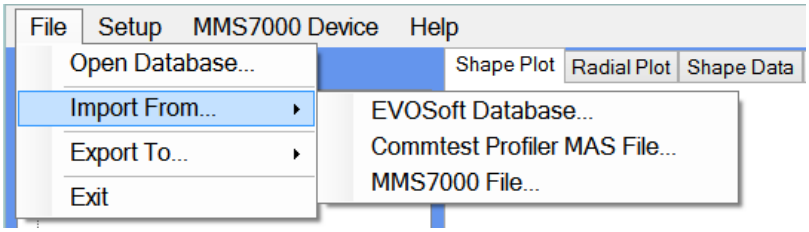
Click **MMS7000 Device** on the Toolbar and then select **User Names** to maintain the list of MMS7000 user names that are available to select from when saving recordings. As for Recording Notes above, the sequence the User Names appear in the list on the MMS7000 is the same as they are displayed in the User Names windows in EVOsoft, which can be altered by selected a User Name and then clicking Move Up or Move Down.



34. Import / Export Data / Backup

Importing Data into EVOsoft

To import data into the database, click **File → Import From..**



From this menu you can Import recordings from another EVOSoft Database, an existing Commtest Profiler MAS File or an MMS7000 File. A MMS7000 File means a .prt file copied directly from the StorageCard\Profilertech\Data folder on the MMS7000 device.

Exporting Data out of EVOsoft

To export recordings to another EVOsoft database:

1. Select **File→ Export To… → EVOsoft database…**
2. Use the **Export to Database** field to select the database to export to on the **Export Recordings to…** window:
    a. If you select an existing database, the recordings you select will be copied to that existing database, adding to whatever recordings it already contains. This is useful when you want to copy recordings from one database to another.
    b. If you **Create a New Database**, the selected recordings will be copied into their own new and otherwise-empty database. This is useful when you want to share only a small group of recordings with another EVOsoft user (see below)
3. Use the Select Recordings section to pick the recordings to export.
4. Finally, click **Export Recordings**. The selected recordings will then be copied to the target database, although note they will not also be deleted from the current database.

Sharing recordings with other EVOsoft user.

The simplest way to share a small group of recordings with another EVOsoft user is to export them to a newly-created database and then just email this new .sdf database file to the other user. Since you are sending them a normal EVOsoft database file, when they receive the file they can then either:

1. Just open it directly in EVOsoft to view the recordings as normal (i.e. no special file conversion or import function is required), and/or
2. If they want to add the recordings to one of their other existing EVOsoft databases, they can use the normal **File → Import From…** functionality, as described previously.

Database Backup

EVOsoft databases are a single .sdf file, and so backups are done using a simple copy-and-paste of the .sdf file in Windows.

NOTE: *Always ensure EVOsoft is closed before attempting to copy a .sdf database file.*

Troubleshooting

Cannot establish Comms between EVOsoft and your MMS7000 Device

1. Ensure that you have installed the required Microsoft device communication utility as described in Section 13. Installing Device Communication Utilities, above.
2. Ensure that the MMS7000 device is fully initialised before connecting to your PC:
    1. Unplug the MMS7000 USB cable from your PC
    2. Press the Power button to put the MMS7000 device into Sleep mode.
    3. After a few seconds, press the Power button to wake it back up
    4. Plug the MMS7000 back into a USB port on your PC
3. Reset the MMS7000 by pressing and holding both the power button and the corresponding button on the other side of the keypad (see Figure 1: How to Hard Reset your MMS7000 device, below) for ~3 seconds until the display turns white, then release the buttons and waiting for the reboot process to complete. The Profiler App will automatically restart and the Profiler should now be ready for use.
4. It is possible that the Windows driver has failed so try the following:
    a. Restart your PC
    b. With the handheld unplugged from the USB port, delete the device driver, and then plug the device back in.
    c. Verify that the device has been correctly detected by Windows by opening Windows File Explorer and ensuring that the device appears under 'My Computer' as an attached Windows CE Portable device. If the device is detected by Windows but not by EVOsoft it is still possible to import recordings manually:
        i. Open File Explorer and double-click the icon that represents the MMS7000 device to view the files it contains.
        ii. Locate the 'Storage Card' folder on the device, and browse to the "…\Storage Card\Profilertech\Data" data folder
        iii. Copy all the .ptr files in this data folder to a location on your PC
        iv. Finally in EVOsoft, use the File → Import From… → MMS File... function to browse to the location of the .ptr files on your PC and import them into your EVOsoft database.

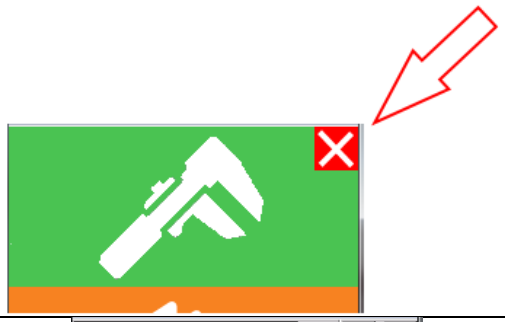
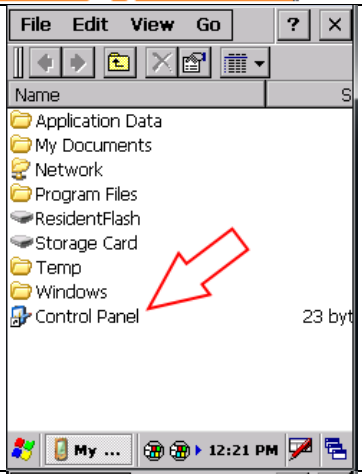
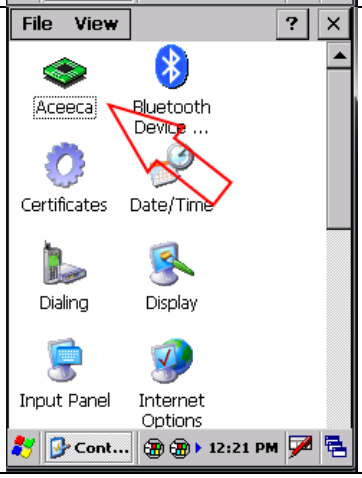
The PROFILER7000 app icon does not appear on the MMS7000 device:

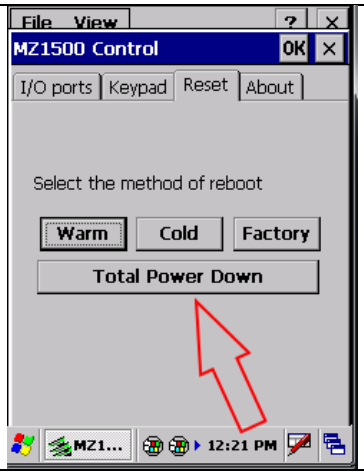
Hard reset the MMS7000 device by pressing the power and the corresponding button on the other side of the device for ~3 seconds until the display turns white and then releasing the buttons and waiting for the reboot process to complete:

Figure 1: How to Hard Reset your MMS7000 device

MMS7000 battery goes flat even when the device is powered off:

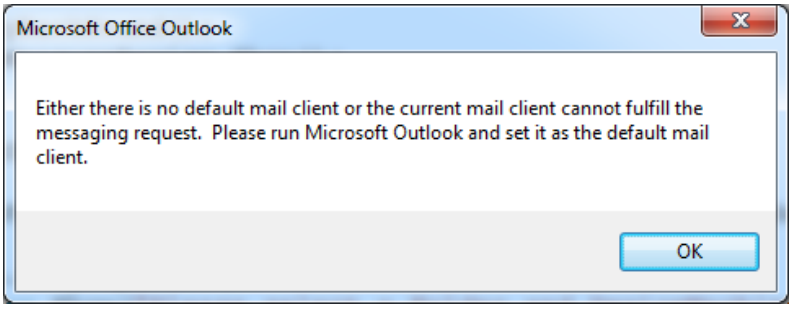
The MMS7000 is based on the Microsoft Windows CE operating system, which has a limitation in that when you press the Power button  , it only puts the device into a 'Deep Sleep' mode rather than powering it off entirely. In this mode, the device is still using a very small amount of battery power and if left in this state the battery will eventually (typically in 3-5 days) go flat. If you don't plan to use your MMS7000 for an extended period, you can completely power it off to conserve the battery as follows:

Step	Display
Close the Profiler7000 app by tapping the red & white X in the top right corner	
On the "desktop", double-tap "Control Panel" *Note: you may see these items as separate icons rather than a list but a Control Panel entry will still appear*	
Double-tap 'Aceeca'	

Finally, on the ‘Reset’ tab, just tap ‘Total Power Down’.	

Microsoft Outlook error message appears when the MMS7000 device is connected:

Some users may see the following message when connecting the MMS7000 device to their PC:



This message appears because the 64-bit version of Microsoft Office is installed on the PC while the Windows communications utilities for the MMS7000 are expecting to find the 32-bit version. The message can be safely acknowledged and then ignored, and its appearance has no negative impact on the operation of the MMS7000 device and EVOsoft software.

Technical Support

For technical support please contact

Support@profilertech.com

Or visit us on the web at

www.profilertech.com